

Surgical instrument set.

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Surgical instrument set

The invention concerns a surgical instrument set for using intermediate eddy endoprostheses, which consist of two seal plates and a sliding core which can be arranged between them.

It has well-known not to replace in the spinal column diseased changed or any longer functional volume disks by intermediate eddy endoprostheses (articles of Büttner Janz, K., Schellnack, K., Zippel, H. ?An alternative treatment strategy with the lumbalen volume disk damage with the volume disk endoprosthesis type of modular SELF-SERVICE Charité?, Z. Orthop. 125 (1987), 1-6). These intermediate eddy endoprostheses are inserted in place of the before removed volume disk between the eddies. The two seal plates exhibit thereby zackenförmige projections/leads, by which they are held to the eddy bodies. On their to each other turned surfaces they exhibit ball-dish-shaped recesses, between which a sliding core is set, which has similarly formed ball-dish-shaped projections/leads. In this way again a relative motion of the eddies is to each other possible after the operation. The seal plates of the endoprosthesis consist thereby of metal while the sliding core exists made of plastic.

A large problem exists when inserting these intermediate eddy endoprostheses. In order to be able to use the intermediate eddy endoprosthesis, facing the eddy bodies must be apart-spread. The use of well-known spreading pliers, which are usually used for operations at the volume disk, however the place would occupy, which the intermediate eddy endoprosthesis was to take. It is to be noted that the intermediate eddy endoprosthesis, for favorable distribution of load, is to rest upon as wide as possible, the measure of the eddy bodies accordingly. Likewise the Auseinanderspreizen facing of the eddy bodies requires considerable forces.

With the usual spreading pliers could be attacked thus if necessary only at the outside edges of the eddy bodies, which are not occupied by the intermediate eddy endoprosthesis. This, only causes existing bone surfaces of the eddy bodies, would be however small for applying the necessary forces too and provokes with the fact the danger that the eddy bodies in these places break in.

The task of the invention exists in the creation of an instrument set, with which the endoprostheses can be used with simultaneous spreading of the eddy bodies and as small a risk of breaking in the eddy bodies as possible.

The solution according to invention consists of the fact that the instrument set exhibits spreading pliers, which exhibit and at the edge a holding essentially u-shaped recess embracing a seal plate at three sides at its front end at each spreading cheek, whereby the thickness of the spreading cheeks essentially is in spreading direction equal to the thickness of the seal plates.

The seal plates are thus embraced on three sides by the spreading cheeks. The two seal plates lie on top of one another thereby first directly. In this position the spreading cheeks are then brought between the two eddy bodies.

▲ top Subsequently, then spreading takes place, so that area for the sliding core is created, whereby spreading must take place still in larger extent, since first the sliding core with its projections/leads must be brought in between the seal plates.

The considerable forces arising with it will transfer not only to small ranges of the eddy bodies, but wide. These Kraft thereby by the seal plates one exercises. Breaking in of the eddy bodies is in this way avoided with greatest possible security. The eddy bodies come essentially only with the parts into contact, with which them also after the operation in contact, i.e. the seal plates.

The spreading cheeks are provided appropriately in the range of the insides of the thighs of the U with slots for taking up the seal plates, which are arranged in for spreading direction the senkrechten level. Thus the seal plates can be slid by the open end of the U laterally into the spreading cheeks. The large spreading forces, which affect the seal plates, are taken up thereby by the side panels of the slots. Kraft acts thereby only in a direction, so that only one slot wall must be trained particularly strongly. Falling out the seal plates must be only prevented by the outside slot wall. Here the slot walls can be more weakly trained, whereby it can be planned that the slots exhibit tapered walls, since then also the seal plates in the appropriate places can according to tapered walls possess, so that no sharp edges are present here.

So that the seal plates cannot slip out forward of the opening of the U, spreading cheek at a front slot end can be intended a springily giving way handle with each. If a seal plate is pushed in into the spreading cheek, then those prevents springily giving way handle the same to fall out. On the other hand if the endoprosthesis is assigned, then the handle becomes giving way, if one wants to again remove the pliers.

One appropriately becomes the seal plates with the spreading procedure in such a way apart-moves that their surfaces attacking at the eddy bodies remain parallel. Therefore it is planned appropriately that the spreading cheeks are connected with a shear-like parallel guide.

One will appropriately plan that the spreading pliers exhibit a solvable rest mechanism for the spread position, so that the operating surgeon has the hands after spreading freely, in order to use the sliding core.

Pushing the spreading pliers in with the seal plates between the eddy bodies, arranged to it, requires relatively much Kraft, which will transfer alone by the spreading pliers very heavily or not at all can. Therefore that the spreading pliers are provided with a projection/lead or a recess in the range of the spreading cheeks, that is appropriately intended and/or. the one essentially transverse to the driving direction aligned Anschlag laughs for an essentially rod-shaped driving instrument exhibits. Kraft for pushing the spreading pliers in thus with the help of a driving instrument one applies, with which the driving strength in the correct direction can be exercised, which is not possible with bent spreading cheeks in particular. The notice surface can have thereby cylindrical or spherical cross section, so that the driving instrument under different angles can be set.

As previously mentioned the spreading forces are very large. Since the spreading pliers have relatively long lever arms, it would become very shapeless, if one trains it so stably that she can exercise the necessary spreading forces in each case. It is intended appropriately therefore that the instrument set exhibits an essentially screwdriver-similar rod-shaped element, which carries end a handle at its, whereby the other end has the form of an oblong plate. After spreading was begun and the spreading cheeks already a certain distance from each other has, the rod-shaped element can be introduced between the cheeks in such a way that the level of the oblong plate is parallel essentially to the level of the spreading cheeks. Then afterwards if the rod-shaped element is turned, then in the place, in which the spreading strength is necessary, a very large Kraft is exerted exactly, until the level of the plate stands essentially perpendicularly to the spreading cheek level. In this position then the rod-shaped element can remain in the spreading pliers, in order to fix this position. If necessary this spreading can be extended gradually by the fact that one uses afterwards a rod-shaped element with a somewhat broader plate, in order to come so gradually to larger widths.

Instead of a plate with essentially rectangular cross section and rounded off edges one could also e.g. an oval part use.

Particularly appropriately the sliding cores can be used, if the instrument set exhibits a retaining instrument for sliding cores, which is rod-shaped and is provided at the front end with springy, the sliding core at the extent over a angle range of somewhat more than 180 DEG embracing retaining elements.

The springy retaining elements hold first the sliding core. If spreading is waived and if the sliding core between the seal plates is held, then the retaining instrument can be pulled out again, whereby the retaining elements separate due to their spring action from the sliding core, which remains at the desired place.

Two einstückig connected retaining elements are intended appropriately, which extend over one angle range each of approximately 90 DEG, which are connected with a bar, itself by the tubularly trained retaining instrument extended, whereby the retaining elements with forward apart-current slants rest inside against the tube end, and whereby at the other end a screw arrangement is intended on the bar for exercising a traction power. Due to the spring action with this execution form the two retaining elements pressed apart, so that an opening forms, into which the sliding core will be introduced can. Afterwards if a traction power is exercised on the bar, then the slants affect inside the pipe, so that the retaining elements are pushed shut one on the other against the spring action and the sliding core to thus hold. Thus the sliding core afterwards from the retaining instrument to be removed can and/or. the retaining instrument from the sliding core to be taken off can be only waived, must then through tricks of the screwing arrangement in against laws the direction the traction power.

In addition, the retaining instrument is to be used particularly appropriately in connection with the spreading pliers, can for other kinds of using the endoprotheses be used. To the invention also an instrument set which exhibits only in or several retaining instruments therefore, belongs.

If the instrument set exhibits further a shaped like a bar element, to which a model of a sliding core is fastened in front, then can with these elements after execution of spreading be determined, which sliding core fits best. For this purpose one will use naturally several of such shaped like a bar elements with different sliding cores. One tries thus the correct size with models of sliding cores out and not with sliding cores, from which then afterwards one is to remain in the endoprosthesis. This is among other things already more appropriate for reasons of sterilization, since a sliding core continuously remaining in the body must be sterilized more carefully than a model of a sliding core, which is again removed after short time.

The instrument set will appropriately exhibit not only several shaped like a bar elements with models of sliding cores, but also several spreading pliers, screwdriver-similar spreading elements and retaining instruments for sliding cores, so that differently large endoprotheses can be used.

The invention is described in the following on the basis favourable execution forms with reference to the attached designs. Show:

Fig. 1 in the cross section an intermediate eddy endoprosthesis, which can be used with the instrument set according to invention;

Fig. 2 spreading pliers of the invention in side view;

Fig. 3 a detail of the spreading pliers of the Fig. 2 in plan view;

Fig. 4 an increased representation of the part of the Fig. 3;

Fig. 5 a cross section opinion along the line V-V von Fig. 4;

Fig. 6 a cross section opinion along the line VI-VI von Fig. 4;

Fig. 7 a total view of a retaining instrument for sliding cores;

Fig. 8 and 9 cross section opinions of the instrument of the Fig. 7 in different work-moderate positions;

Fig. 10 a driving instrument, that with the spreading pliers of the Fig. 2 to 6 to be used can do;

Fig. 11 an additional schraubendreherförmiges spreading instrument;

Fig. 12 a shaped like a bar element with a model of a sliding core.

In Fig. 1 is represented in the cross section a part of a spinal column with endoprosthesis assigned in it. The spinal

column consists of a multiplicity of eddy bodies 1, between which with healthy humans volume disks 2 are arranged. The volume disk between the two middle eddy bodies 1 is replaced by the intermediate eddy endoprosthesis, which can be used in connection with the instrument set according to invention. The endoprosthesis consists of two seal plates 3 and one between the same arranged sliding body 4. On the side arranged to the eddy body 1 the seal plate 3 exhibits an essentially even surface 5, which is provided with serrate-like projections/leads 6, which penetrate into the eddy body, in order to hold so the seal plates surely 3 to the eddy body 1. On the opposite side the seal plates 3 provided with an essentially ball-dish-shaped recess 7 are. The seal plates 3 normally consist of metal. Between the seal plates 3 the sliding core 4 is arranged, which exhibits 7 corresponding ball-dish-shaped projections/leads 8 to the ball-dish-shaped recesses. The sliding body 4 normally consists thereby of plastic.

Into the Fig. 2 to 6 spreading pliers shown 9 two parallel arranged spreading cheeks 10, 11, those exhibits in a shear-like joint 12 by levers 13, 14 to be so apart spread can that their surfaces remain parallel. The levers 13, 14 are pressed apart thereby by feathers/springs 15, so that the spreading cheeks 10, 11 are normally squeezed together. Against Kraft of the feather/spring 15 if the levers 13, are squeezed 14 together then the spreading cheeks 10, 11 are pressed apart. Teeth of a check element 16, that rest by a feather/spring 17 in Fig. 2 in the clockwise direction is spring-tensioned, in appropriate teeth or projections/leads of the lower lever 14 in, so that the expansion position reached in each case is held by the element 16, which is fastened tiltable to the lever 13.

Like this in Fig. is evident to 3, are the spreading cheeks 10, 11 relative to the pliers longitudinal direction bent, since one can lead so the spreading cheeks better into the opened area between the eddy bodies. Since for this normally large forces are necessary, the spreading cheeks 10, 11 at their rear end exhibit a cylindric recess 18, at which a driving instrument can be set, that in Fig. 10 shown is.

The spreading cheeks 10, 11 exhibit an u-shaped recess 19 at their front end, into which a seal plate 3 can be inserted. In the cross section opinion of the Fig. thereby only one of these seal plates 3 is represented 5. The seal plates 3 are held in slots 20, which extend along the thighs of the U. The seal plates 3 are only held 11 thereby to the edge in appropriate slots 20 of the spreading cheeks 10, which are tapered on a side. On the side, on which by the seal plates 3 largest Kraft is exercised, the groove reason is however even and essentially parallel to the spreading cheek level.

Into the Fig. 4 to 6 one recognizes still another springy handle 21, which normally locks the groove exit and thus a seal plate 3 included there holds. This springy handle 21 gives way however, if wanted a seal plate is to be put into the groove 20 or be taken off the spreading pliers after bringing in the endoprosthesis is.

As one from the Fig. , has the spreading cheeks 10, 11 in the front part, which is spent between the eddy bodies, essentially the thickness of the seal plates 3 recognizes 4 to 6. The teeth 6 stand out thereby over this range. Only behind the range of the spreading cheeks, which is brought in between the eddy bodies, to have the spreading cheeks stability increasing Verdickung 22.

Into the Fig. a retaining instrument 23 represented 7 to 9 for sliding cores 4 is. Fig. 7 is thereby an opinion. Fig. 8 and 9 is cross section representations in two different function positions.

The retaining instrument 23 exhibits an essentially u-shaped retaining element, which consists of two thighs 24, 25. The thighs normally take thereby in Fig. 8 rest position shown, with which the thighs 24, 25 cover the sliding core 4 only relatively loosely. One turns however at the screw 26 at the rear end of a handle 27, then on a linkage 29, which is connected with the retaining element parts of 24, 25, arranged in an external pipe 28, a traction power is exercised. Thus the retaining element parts push 24, 25 with tapered surfaces 30 against appropriate tapered surfaces 31 of the pipe 28 and/or. a beginning at the same, so that the two parts of 24, 25 are squeezed together and the sliding core 4 to hold.

In Fig. a driving instrument 32 is shown 10, which is essentially rod-shaped trained. At its front end it carries querstehendes a cylindrical part of 33, that into the recess 18 of the spreading pliers 9 the Fig. 2 to 4 to be used can do. If one holds then the driving instrument 32 to the handle 34 and if an impact force practices opposite end of 35 on that the cylindrical part of 33 up, then the spreading pliers 9 with the seal plates arranged to it can be brought into the area between the eddy bodies.

After spreading up to a certain extent was made, further spreading can with the help of the instrument 36 the Fig. 11 takes place. This instrument 36 possesses likewise a handle 37 and is widened at the other end screwdriver-like to a plate 38. This plate 38 is brought in between the spreading cheeks in a position, in which the level of the plate 38 is arranged essentially parallel to the level of the spreading cheeks or includes at least no all too large angle. By tricks of the instrument 36 then the spreading cheeks can be pressed apart further.

In Fig. still another shaped like a bar element 39 is finally shown 12, which carries the model of a sliding core 4 in front. With the help of the instrument 39 can be put out by trying, which sliding nuclear size is best suitable.

(19)



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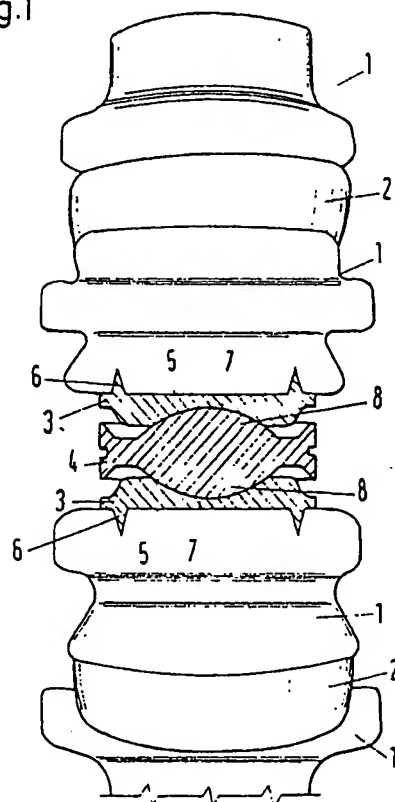
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(54) Chirurgischer Instrumentensatz.

(57) Der chirurgische Instrumentensatz zum Einsetzen von Zwischenwirbel-Endoprothesen, die aus zwei Abschlußplatten und einem dazwischen anzuordnenden Gleitkern bestehen, zeichnet sich dadurch aus, daß er eine Spreizzange (9) aufweist, die an ihrem vorderen Ende an jeder Spreizbacke (10, 11) eine eine Abschlußplatte an drei Seiten umgreifende und am Rand festhaltende im wesentlichen U-förmige Ausnehmung aufweist, wobei die Dicke der Spreizbacken (10, 11) in Spreizrichtung im wesentlichen gleich der Dicke der Abschlußplatten ist.

Fig.1



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